

*King Saud University*  
*College of Business Administration*  
*Department of Health Administration - Masters` Program*

**HHA 513 Financing Health Systems**  
**Second Semester 1442/ 1443**

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# Estimating Costs

## Learning Objectives

- **Explain** how costs are classified according to their relationship with volume.
- **Describe** how costs are classified according to their relationship with the unit being analyzed.
- **Explain** why proper cost allocation is important to healthcare organizations.
- **Define** the terms cost pool and cost driver, and describe the characteristics of a good cost driver.
- **List the three primary methods** used to allocate overhead costs among revenue-producing (patient services) departments.
- **Describe three methods used** to cost individual services: the cost-to-charge ratio (CCR), relative value units (RVUs), and activity-based costing (ABC).

# Estimating Costs

## *Introduction*

- *Healthcare managers have many responsibilities, including planning for the future, overseeing the day-to-day activities of line employees, and establishing policies that control the operations of the organization.*
- *For example, the practice manager of a primary care practice must estimate future demand (volume) and see to it that the practice has the facilities, staff, and supplies necessary to meet this demand.*

# Estimating Costs

## *Introduction*

- *The practice manager does so primarily by creating budgets that use forecasted future volume to estimate the resources needed to meet expected patient demand.*
- *As the future unfolds, the practice manager must monitor operations to see whether the volume estimates were correct. If not, supplies and staffing requirements must be adjusted to reflect variations from forecasts.*
- *Finally, the practice manager must constantly review the resources used to ensure that they are being used appropriately and efficiently and are being acquired at the lowest possible costs.*

# Estimating Costs

## *Introduction*

- *All these activities require information—a great deal of it.*
- *Furthermore, it has to be compiled in a format that facilitates analysis, interpretation, and decision making.*
- *Without timely and relevant information, healthcare managers would be making decisions essentially in the dark.*

# Estimating Costs

## *Introduction*

- *The foundation of a good information system is the manager's ability to estimate costs with confidence. This task is not easy.*
- *The first step is clarifying what is meant by the term "cost."*
- *Cost is a word that can have many meanings, depending on the perspective taken.*
- *For example, a health insurer might define the cost of care as the amount of the payment made to the health care provider.*
- *However, this payment may have very little relationship with the actual cost of resources required to provide the service.*

# Estimating Costs

## *Introduction*

- *Cost, A resource use associated with providing or supporting a specific service.*
- *Within health care organizations, costs can be measured at various levels—for example, the entire organization, a single department, a specific service, or an individual patient.*
- *At each of these levels, and depending on the decision to be made, managers must decide which costs are relevant.*

# Estimating Costs

## *Introduction*

- *With increasing pressure to control the costs of healthcare and shifts toward value-based payment models, managers must understand the true costs of services.*
- *To improve their performance on this and other similar measures, hospital leaders, in collaboration with providers, can use detailed cost data to understand and eliminate unnecessary resource utilization.*



# Estimating Costs

## *Accounting Basics*

- *Accounting is split into two primary areas: managerial accounting and financial accounting.*
- *Whereas financial accounting focuses on the reporting of historical operational and financial results to external stakeholders, managerial accounting focuses on the development of information used internally for managerial decision making.*

# Estimating Costs

## *The Basics of Managerial Accounting*

- *Managerial accounting information is used in routine budgeting processes, to allocate managerial bonuses, and to make pricing and service decisions, all of which deal with subunits of an organization.*
- *In addition, managers can use managerial accounting data for special purposes, such as assessing alternative modes of delivery or projecting the profitability of a particular reimbursement contract.*

# Estimating Costs

## *The Basics of Managerial Accounting*

- *Because managers are more concerned with what will happen in the future than with what has happened in the past, managerial accounting is for the most part forward-looking.*
- *However, because most of the future is unknown, compiling managerial accounting information requires making many assumptions about future events.*

# Estimating Costs

## *The Basics of Managerial Accounting*

- *A critical part of managerial accounting is the measurement of costs.*
- *One issue that makes this task difficult is the fact that no single definition of the term cost exists.*
- *Rather, different costs exist for different purposes.*
- *As a general rule, for healthcare providers, a cost involves a resource use associated with providing or supporting a specific service.*

# Estimating Costs

## *The Basics of Managerial Accounting*

- *However, the cost per service identified for pricing purposes can differ from the cost per service used for management control purposes.*
- *Also, the cost per service used for long-range planning purposes may differ from the cost per service defined for short-term purposes.*
- *Thus, when dealing with costs, managers have to understand the context so that the correct cost is identified.*

# Estimating Costs

## *The Basics of Managerial Accounting*

- *To complicate matters further, costs do not necessarily reflect actual cash outflows.*
- *Costs are classified in two primary ways:*
  1. *by their relationship to the volume (amount) of services provided and*
  2. *by their relationship to the unit (i.e., department) being analyzed.*

# Estimating Costs

## *Cost Classification Fixed versus Variable Costs*

- *One way to classify costs is on the basis of their relationship to the amount of services provided, where amount of services is often described as volume or utilization.*
- *This classification is often referred to as cost behavior because it seeks to understand how costs will change or behave as volume increases or decreases.*

# Estimating Costs

## *Cost Classification Fixed versus Variable Costs*

### *Volume*

- *The amount of services provided (e.g., number of visits, number of inpatient days).*
- *Also called utilization.*

### *Cost Behavior*

- *The change in an organization's total costs in response to a change in volume or utilization.*



# Estimating Costs

## *Volume*

- *Volume may be forecasted in a number of ways.*
- *One way is to review historical trends, say, over the past five to ten years.*
- *In many situations, the past is a good predictor of the future.*
- *If the manager believes this to be the case, then the manager can apply statistical analysis (linear regression) to the historical data to predict future volumes.*

# Estimating Costs

## *Volume*

- *If past data are not available or if significant changes in the operating environment are taking place, then volume forecasting becomes more difficult.*
- *In that situation, the manager must evaluate population and disease trends in the service area, actions of competitors, pricing strategies, the impact of new contracts with insurers, and a whole host of additional factors that influence future volume.*
- *If a provider's volume forecast turns out to be inaccurate, the consequences can be severe.*

# Estimating Costs

## *Volume*

- *In spite of the difficulties in forecasting volume with precision, managers typically have some idea of the potential range.*
- *For example, the manager of Northside Clinic, a small walk-in clinic, might estimate that the total number of patient visits for next year will likely range from 12,000 to 14,000, or from about 34 to 40 per day.*

# Estimating Costs

## *Volume*

- *If utilization is not likely to fall outside these bounds, then the range of 12,000 to 14,000 annual visits defines the clinic's relevant range.*
- *Note that the relevant range pertains to a particular period—in this case, next year. For other periods, the relevant range might differ from this estimate.*

# Estimating Costs

## ***Volume***

- *The amount of services provided (e.g., number of visits, number of inpatient days). Also called utilization.*

## ***Cost Behavior***

- *The change in an organization's total costs in response to a change in volume or utilization.*

## ***Relevant Range***

- *The range of output (volume) for which the organization's cost structure holds.*

# Estimating Costs

## *Fixed Versus Variable Costs*

- *One way to classify costs is by their relationship to volume.*
- *Fixed costs are known and predictable regardless of volume (within some relevant range).*
- *Of course, no costs are fixed over the long run or over large volume changes.*
- *At some level of increasing volume, healthcare businesses must incur additional fixed costs for new facilities and equipment, additional staffing, and so on.*

# Estimating Costs

## *Fixed Versus Variable Costs*

- *Likewise, if volume decreases by a substantial amount, an organization likely would reduce fixed costs by shedding some of its facilities and parts of its equipment and labor base.*
- *Conversely, variable costs depend on the volume of services supplied.*
- *Consider a clinical laboratory. The costs of the building, equipment, and personnel to run the lab are known with some certainty for the coming year.*

# Estimating Costs

## *Fixed Versus Variable Costs*

- *Whereas some costs are fixed regardless of volume (within the relevant range), other resources are more or less consumed as volume dictates.*
- *Costs that are related to (depend on) volume are called variable costs.*
- *For example, the costs of the clinical supplies (e.g., rubber gloves, tongue depressors, hypodermics, bandages) used by the **Northside Clinic** would be classified as **variable costs**.*



# Estimating Costs

## *Fixed Versus Variable Costs*

- *Furthermore, these costs are independent of the number of tests actually conducted. Such costs are fixed.*
- *However, the annual costs of reagents and other test supplies depend on the number (and type) of tests conducted—the greater the number of tests, the greater these costs. Thus, the accounting system would classify these costs as variable.*

# Estimating Costs

## *Fixed Versus Variable Costs*

### *Variable Cost Rate*

*The added cost for each additional unit of service, most often assumed to be constant over the relevant range of volume (e.g., the variable cost rate at a neighborhood walk-in clinic is determined to be \$15 per patient visit).*

### *Total Variable Costs*

*The variable cost rate multiplied by volume (e.g., if a walk-in clinic has a variable cost rate of \$15 per visit and experiences 10,000 visits annually, total variable costs for the year equal  $\$15 \times 10,000 = \$150,000$ ).*

# Estimating Costs

## *Cost Structure and Relevant Range*

- *In general, an organization's underlying cost structure is defined for a specified relevant range.*
- *For example, assume that Atlanta Clinic's underlying cost structure is given as follows:*

$$\begin{aligned} \text{Total costs} &= \text{Fixed costs} + \text{Total variable costs} \\ &= \$4,967,462 + (\$28.18 \times \text{Number of visits}). \end{aligned}$$

# Estimating Costs

## *Cost Structure and Relevant Range*

- *Assume that the expected number of visits next year is 75,000 and the relevant range for this cost structure is 70,000 to 80,000 visits.*
- *Now, assume that a new payer makes a proposal to the clinic that would increase next year's volume by 10,000 visits, which would increase the expected number of visits to 85,000.*

# Estimating Costs

## *Cost Structure and Relevant Range*

- The financial staff presents you, the CEO, with an analysis of the costs under the new proposal that was calculated as follows:*

$$\begin{aligned} \text{Total costs} &= \$4,967,462 + (\$28.18 \times 85,000) \\ &= \$4,967,462 + \$2,395,300 = \$7,362,762. \end{aligned}$$

- What is your initial reaction to the analysis? Is it valid or must it be redone? What variable in the underlying cost structure is most likely to change at a volume of 85,000 visits?*

# Estimating Costs

## *Underlying Cost Structure*

- *Healthcare managers are vitally interested in how costs are affected by changes in the amount of services supplied.*
- *The relative mix of fixed and variable costs, called underlying cost structure (or just cost structure), is used by managers in planning, control, and decision making.*
- *The primary reason for defining an organization's cost structure is to provide managers with a tool for forecasting costs and profits at different volume levels.*

# Estimating Costs

## *Underlying Cost Structure*

- *For illustrative purposes, let us assume the relevant range is from zero to 20,000 tests. (Of course, the actual relevant range might be from 15,000 to 20,000 tests.)*
- *As noted in exhibit 4.1, the laboratory has \$150,000 in fixed costs that consist primarily of labor, facilities, and equipment.*
- *These costs will occur even if the laboratory does not perform one test.*

# Estimating Costs

## *Underlying Cost Structure*

- *In addition to the fixed costs, each test, on average, requires \$10 in laboratory supplies, such as glass slides, blood test tubes, and reagents.*
- *The per unit (per test, in this example) variable cost of \$10 is defined as the variable cost rate.*
- *If laboratory volume doubles—for example, from 500 to 1,000 tests—total variable costs will double from \$5,000 to \$10,000.*



# Estimating Costs

## *Underlying Cost Structure*

- *However, the variable cost rate of \$10 per test remains the same whether the test is the first, the hundredth, or the thousandth.*
- *Total variable costs, therefore, increase or decrease proportionately as volume changes, but the variable cost rate remains constant.*
- *Fixed costs, in contrast to total variable costs, remain unchanged as the volume varies.*

# Estimating Costs

## *Underlying Cost Structure*

*When volume doubles from 500 to 1,000 tests, fixed costs remain at \$150,000. Because all costs in this example are either fixed or variable, total costs are merely the sum of the two.*

*For example, at 5,000 tests, total costs are calculated thus:*

$$\begin{aligned} & \text{Fixed costs} + \text{Total variable costs} \\ &= \$150,000 + (5,000 \times \$10) \\ &= \$150,000 + \$50,000 = \$200,000. \end{aligned}$$

# Estimating Costs

## *Underlying Cost Structure*

- *Because variable costs are tied to volume, total variable costs, and hence total costs, increase as the volume increases, even though fixed costs remain constant.*
- *The rightmost column in exhibit 4.1 contains average cost per unit of volume, which in this example is average cost per test.*
- *It is calculated by dividing total costs by volume.*
- *At 5,000 tests, with total costs of \$200,000, the average cost per test is  $\$200,000 \div 5,000 = \$40$ .*

# Estimating Costs

## *Underlying Cost Structure*

- *Because fixed costs are spread over more tests as volume increases, the average cost per test declines as volume increases.*
- *For example, when volume doubles from 5,000 to 10,000 tests, fixed costs remain at \$150,000, but fixed cost per test declines from  $\$150,000 \div 5,000 = \$30$  to  $\$150,000 \div 10,000 = \$15$ .*
- *With fixed cost per test declining from \$30 to \$15, the average cost per test goes down from  $\$30 + \$10 = \$40$  to  $\$15 + \$10 = \$25$ .*

# Exhibit 4.1 Cost Structure Illustration

<i>Variable Cost per Test</i>		<i>Fixed Costs per Year</i>	
<i>Laboratory supplies</i>	<i>\$10</i>	<i>Labor</i>	<i>\$100,000</i>
		<i>Other fixed costs</i>	<i>50,000</i>
		<i>Total</i>	<i>\$150,000</i>

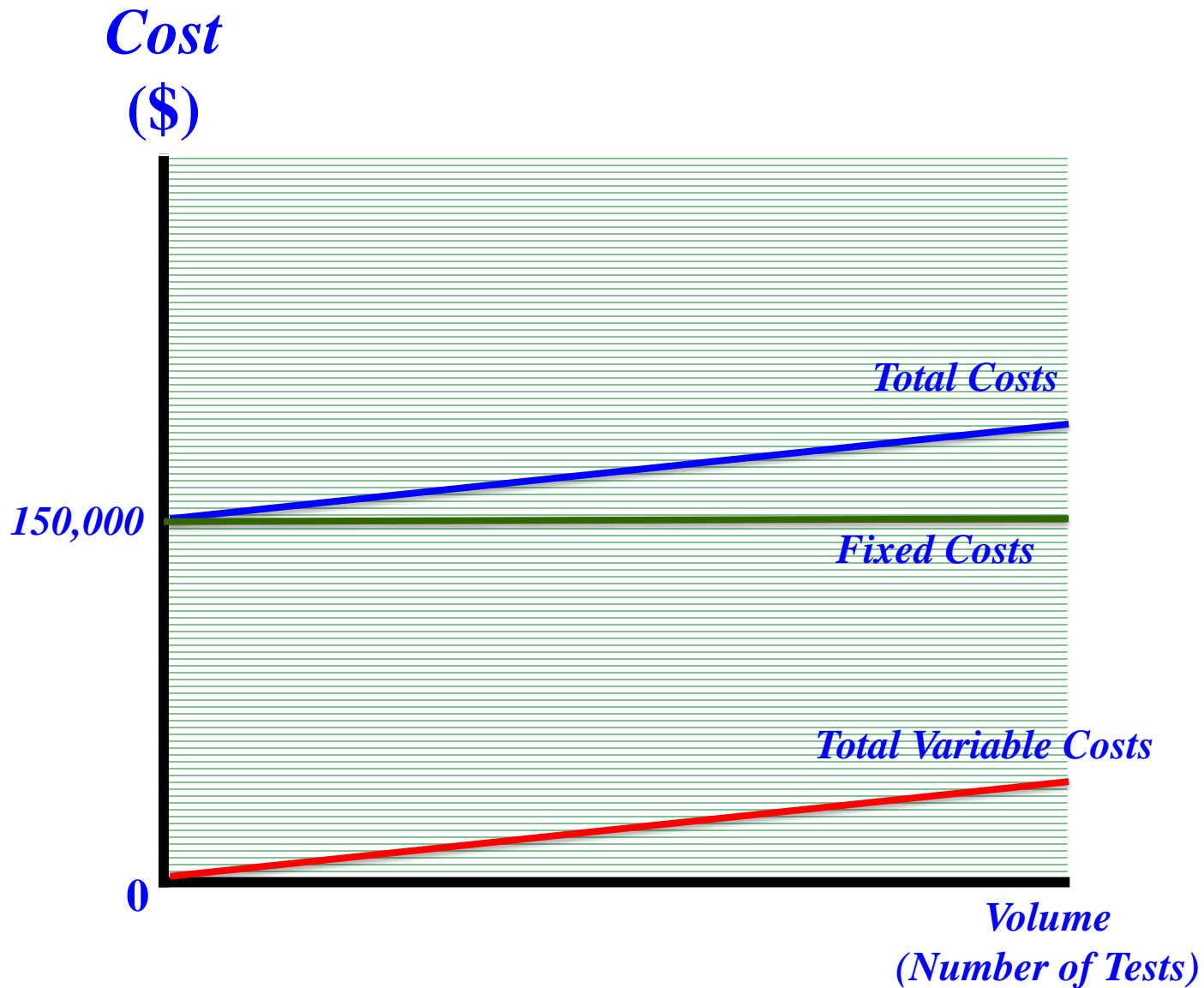
<i>Volume</i>	<i>Fixed Costs</i>	<i>Total Variable Costs</i>	<i>Total Costs</i>	<i>Average Cost per Test</i>
<i>0</i>	<i>\$150,000</i>	<i>0</i>	<i>\$150,000</i>	<i>--</i>
<i>1</i>	<i>150,000</i>	<i>10</i>	<i>150,010</i>	<i>\$150,010.00</i>
<i>50</i>	<i>150,000</i>	<i>500</i>	<i>150,500</i>	<i>3,010.00</i>
<i>100</i>	<i>150,000</i>	<i>1,000</i>	<i>151,000</i>	<i>1,510.00</i>
<i>500</i>	<i>150,000</i>	<i>5,000</i>	<i>155,000</i>	<i>310.00</i>
<i>1,000</i>	<i>150,000</i>	<i>10,000</i>	<i>160,000</i>	<i>160.00</i>
<i>5,000</i>	<i>150,000</i>	<i>50,000</i>	<i>200,000</i>	<i>40.00</i>
<i>10,000</i>	<i>150,000</i>	<i>100,000</i>	<i>250,000</i>	<i>25.00</i>
<i>15,000</i>	<i>150,000</i>	<i>150,000</i>	<i>300,000</i>	<i>20.00</i>
<i>20,000</i>	<i>150,000</i>	<i>200,000</i>	<i>350,000</i>	<i>17.50</i>

# Estimating Costs

## *Underlying Cost Structure*

- *The fact that higher volume reduces average fixed cost, and therefore average cost per unit of volume, has important implications for profitability related to volume changes.*
- *In economics, the state of declining average cost as volume increases is called economies of scale.*
- *The cost behavior presented in exhibit 4.1 in tabular format is presented in graphical format in exhibit 4.2.*

# Exhibit 4.2 Cost Structure Graph



# Estimating Costs

## *Underlying Cost Structure Semifixed Costs*

- *Costs that are fixed, but not at a single amount throughout the entire relevant range.*
- *Before we leave this illustration of underlying cost structure, we should mention that fixed and variable costs represent two ends of the volume classification spectrum.*
- *Here, in the relevant range, the costs are either independent of volume (**fixed**) or directly related to volume (**variable**).*
- *A third classification, **semifixed costs**, falls between the two extremes.*



# Estimating Costs

## *Underlying Cost Structure Semifixed Costs*

- *To illustrate, assume that the actual relevant range of volume for the clinical laboratory is up to 20,000 tests.*
- *However, the laboratory's current workforce can only handle up to 17,500 tests per year, so an additional technician, at an annual cost of \$35,000, would be required if volume exceeds that level.*

# Estimating Costs

## *Underlying Cost Structure Semifixed Costs*

- *Now, labor costs are fixed from 15,000 to 17,500 tests and again at a higher level from 17,500 to 20,000 tests, but they are not fixed at the same level throughout the entire relevant range of 15,000 to 20,000 tests.*
- *Semifixed costs are fixed within ranges of volume, but multiple ranges of semifixed costs occur within the relevant range.*

# Estimating Costs

## *Cost Classification 2:*

### *Direct versus Indirect (Overhead) Costs*

- *The second major cost classification is by relationship to the unit being analyzed.*
- *Some costs—about 50 percent of a large healthcare organization's cost structure—are unique to the reporting subunit and hence usually can be identified with relative certainty.*

# Estimating Costs

## *Direct versus Indirect (Overhead) Costs*

- *To illustrate, again think in terms of a hospital's clinical laboratory.*
- *Certain costs are unique to the laboratory—for example, the salaries and benefits for the technicians who work there and the costs of the equipment and supplies used to conduct the tests.*
- *These costs, which would not occur if the laboratory were closed, are classified as the direct costs of the department. Direct costs constitute only a portion of the laboratory's total costs.*

# Estimating Costs

## *Direct versus Indirect (Overhead) Costs*

- *The remaining resources used by the laboratory are not unique to the laboratory; the laboratory shares many resources of the hospital.*
- *For example, the laboratory shares the hospital's physical space as well as its infrastructure, which includes information systems, utilities, housekeeping, maintenance, medical records, and general administration.*

# Estimating Costs

## *Direct versus Indirect (Overhead) Costs*

- *The costs not borne solely by the laboratory but shared by all the hospital's departments are called indirect (overhead) costs.*
- *Indirect costs, in contrast to direct costs, are more difficult to measure at the department level because they arise from shared resources—that is, if the laboratory were closed, the indirect costs would not disappear.*
- *Perhaps some indirect costs could be reduced, but the hospital still requires a basic infrastructure to operate its remaining departments.*

# Estimating Costs

## *Direct versus Indirect (Overhead) Costs*

- *Note that the direct or indirect classifications have relevance only at the subunit level.*
- *When the entire organization is considered, all costs are direct.*
- *The two cost classifications (fixed or variable and direct or indirect) overlay one another.*
- *That is, fixed costs typically include both direct and indirect costs, while variable costs generally include only direct costs.*

# Estimating Costs

## *Direct versus Indirect (Overhead) Costs*

- *For example, the fixed costs of a hospital laboratory include both salaried labor (direct) and facilities (overhead), but the variable costs, such as reagents and other supplies, are all direct costs.*
- *Conversely, direct costs usually include fixed and variable costs, while indirect costs typically include only fixed costs.*
- *Although this mixing of cost classifications can give anyone a headache, the good news is that the classifications typically are used independently of one another.*



# Estimating Costs

## *Direct versus Indirect (Overhead) Costs*

- *In addition to their relationship to volume, costs can be classified by their relationship to the unit being analyzed.*
- *Those costs that are unique to a department, and hence would dis-appear if the department were closed, are called direct costs.*
- *Costs incurred from the use of resources shared across the organization are classified as indirect (overhead) costs.*

# Estimating Costs

## *Direct versus Indirect (Overhead) Costs*

- *For example, the costs of the supplies used by a hospital's emergency department are direct costs; they would disappear if the department were closed.*
- *The costs of facilities (the space used) remain, so they represent overhead costs to the emergency department.*

# Estimating Costs

## *Cost allocation*

*Cost Allocation* **The assignment (*allocation*) of overhead costs, such as financial services costs, from a support department to the patient services departments.**

## *Full Costs*

*The sum of direct and indirect (overhead) costs. Thus, full costs include both direct and indirect (overhead) costs.*

# Estimating Costs

## *Cost allocation*

- *A critical part of cost measurement at the department level is the assignment, or allocation, of overhead costs.*
- *Cost allocation is a process whereby managers allocate the costs of one department to other departments.*
- *Because this process does not occur in a marketplace setting, no observable prices exist for the transferred services.*

# Estimating Costs

## *Cost allocation*

- *Thus, cost allocation must, to the extent possible, establish prices that mimic those that would be set under market conditions.*
- *What costs in a health services organization must be allocated?*
- *Typically, the costs associated with facilities and support personnel (e.g., land and buildings, administrators, financial staffs, and housekeeping and maintenance personnel) must be allocated to those departments that generate revenues for the organization (generally, patient services departments).*

# Estimating Costs

## *Cost allocation*

- *The allocation of support costs to patient services departments is necessary because there would be no need for support costs if there were no patient services departments.*
- *Thus, decisions regarding pricing and service offerings by the patient services departments must be based on the full costs associated with each service, including both direct and overhead costs.*

# Estimating Costs

## *Cost allocation*

- *Clearly, the proper allocation of overhead costs is essential to good decision making in healthcare organizations.*
- *The goal of cost allocation is to assign all the costs of an organization to the activities that cause them to be incurred.*
- *Ideally, healthcare managers track and assign costs by individual patient, physician, diagnosis, reimbursement contract, and so on.*

# Estimating Costs

## *Cost allocation*

- *With complete cost data available in the organization's managerial accounting system, managers can make informed decisions regarding how to control costs, what services to offer, and how to price those services.*
- *Of course, the more data needed, the higher the costs of developing, implementing, and operating the system. As in all situations, the benefits associated with more accurate cost data must be weighed against the costs required to develop such data.*



# Estimating Costs

## *Cost Pools*

- *The first step in allocating costs is to identify the cost pools and the cost drivers.*
- *Typically, a cost pool consists of all the direct costs of one support department.*
- *However, if the services of a single support department differ substantially, and if the patient services departments use the different services in varying proportions, the costs of that support department may need to be separated into multiple pools.*

# Estimating Costs

## *Cost Pools*

- *A cost pool is a group of overhead costs to be allocated to the patient services departments.*
- *Typically, a cost pool consists of all the direct costs of one overhead department.*
- *For example, the costs associated with the Housekeeping Department might constitute a cost pool.*

# Estimating Costs

## *Cost Pools*

- *To illustrate multiple cost pools, suppose a hospital's Financial Services Department provides two significantly different services: patient billing and managerial budgeting.*
- *Furthermore, assume that the Routine Care Department uses proportionally more patient billing services than the Laboratory Department does, but Laboratory proportionally uses more budgeting services than Routine Care does.*
- *In this situation, it would be best to create two cost pools for one support department.*

# Estimating Costs

## *Cost Pools*

- *In this situation, it would be best to create two cost pools for one support department.*
- *The total costs of Financial Services would be divided into a billing pool and a budgeting pool.*
- *Then, cost drivers would be chosen for each pool and the costs allocated to the patient services departments as described in the following sections.*

# Estimating Costs

## *Cost Drivers*

- *One of the most important steps in the cost allocation process is the identification of proper cost drivers.*
- *The theoretical basis for identifying cost drivers is the extent to which the costs from a pool actually vary as the value of the driver changes.*

# Estimating Costs

## *Cost Drivers*

- *A good cost driver provides the most accurate cause-and-effect relationship between the use of services and the costs of the department providing those services, so that more costs are allocated to departments that create the greatest need for support department resources.*

# Estimating Costs

## *Cost Drivers*

- *A cost driver is the basis for allocating a cost pool.*
- *For example, if the cost pool consists of the direct costs of the Housekeeping Department, then the cost driver might be the amount of space occupied by each patient services department.*

# Estimating Costs

## *Cost Drivers*

- *The theory is that the greater the amount of square footage occupied by a patient services department, the greater the amount of housekeeping services required.*
- *Effective cost drivers have two important attributes:*
- *They are perceived by all involved as being fair, and they promote organizational cost reduction.*



# Estimating Costs

## *Cost Drivers*

- *Effective cost drivers possess two primary characteristics.*
- *The first is fairness—that is, do the cost drivers chosen result in an allocation that is equitable to the patient services departments?*
- *The second, and perhaps more important, characteristic is cost reduction—that is, do the cost drivers chosen create incentives for departments to use fewer overhead services?*

# Estimating Costs

## *Cost Drivers*

- *For example, does a department with 10,000 square feet of space use twice the amount of housekeeping services as a department with only 5,000 square feet of space?*
- *The closer the relationship (correlation) between actual overhead resource expenditures at each patient services department and the value of the cost driver, the better the cost driver is and hence the better the resulting cost allocations.*

# Estimating Costs

## *Cost Drivers*

- *For example, inpatient department managers can do little to influence overhead cost allocations if the cost driver for administrative support is patient days.*
- *In fact, the action needed to reduce the overhead allocation—reduction in patient days—may lead to negative financial consequences for the organization if it is paid on a fee-for-service basis.*
- *An effective cost driver encourages patient services department managers to take overhead cost reduction actions that do not have negative implications for the organization.*

# Estimating Costs

## *The Allocation Process*

- *Exhibit 4.3 summarizes the steps involved in allocating overhead costs, illustrating how Prairie View Clinic allocated its housekeeping costs for the 2022 budget.*
- *First, the cost pool must be established. In this case, the clinic is allocating house-keeping costs, so the cost pool is the projected total direct costs of the Housekeeping Department, \$100,000.*

# Estimating Costs

## *The Allocation Process*

- *Second, the most effective cost driver must be identified.*
- *After considerable investigation, Prairie View's managers conclude that the best cost driver for housekeeping costs is labor hours—that is, the number of hours of housekeeping services required by the clinic's departments is the measure most closely related to the actual cost of providing these services.*

# Estimating Costs

## *The Allocation Process*

- *The intent here, as explained earlier, is to pick the cost driver that:*
  1. *provides the most accurate cause-and-effect relationship between the use of housekeeping services and the costs of the Housekeeping Department and*
  2. *creates an incentive to use fewer housekeeping services.*

# Estimating Costs

## *The Allocation Process*

- *Third, the allocation rate must be calculated.*
- *For 2022, Prairie View's managers estimate that Housekeeping will provide a total of 10,000 hours of service to the departments that will receive the allocation.*
- *Note that the third step involves calculation of the allocation rate*

# Estimating Costs

## *The Allocation Process*

- Now that the cost pool and cost driver have been defined and measured, the allocation rate is established by dividing the expected total overhead cost (the cost pool) by the expected total volume of the cost driver:*

*$\$100,000 \div 10,000 \text{ hours} = \$10 \text{ per hour of services provided.}$*



# Estimating Costs

## *The Allocation Process*

- *Fourth, the allocation must be made to each department.*
- *To illustrate the allocation, consider the Physical Therapy (PT) Department, one of Prairie View's patient services departments.*
- *For 2022, PT is expected to use 3,000 hours of housekeeping services, so the dollar amount of housekeeping overhead allocated is =*  
$$**\$10 \times 3,000 = \$30,000.**$$

**Exhibit 4.3**  
**Prairie View**  
**Clinic:**  
**Allocation of**  
**Housekeeping**  
**Department**  
**Overhead to**  
**the Physical**  
**Therapy**  
**Department**

**Step One:** Determine the cost pool. The departmental costs to be allocated are for the Housekeeping Department, which has total budgeted costs of \$100,000.

**Step Two:** Determine the cost driver. The best cost driver was judged to be the number of hours of housekeeping services provided. An expected total of 10,000 hours of such services will be provided to those departments that will receive the allocation.

**Step Three:** Calculate the allocation rate.  $\$100,000 \div 10,000 \text{ hours} = \$10 \text{ per hour of housekeeping services provided.}$

**Step Four:** Determine the allocation amount. The Physical Therapy Department uses 3,000 hours of housekeeping services, so its allocation of Housekeeping Department overhead is  $\$10 \times 3,000 = \$30,000.$

# Estimating Costs

## *The Allocation Process*

- *Other departments in the clinic will also use housekeeping services, and their allocations will be made in a similar manner.*
- *The \$10 allocation rate per hour of services used is multiplied by the amount of each department's usage of housekeeping services to obtain the dollar allocation.*

# Estimating Costs

## *The Allocation Process*

- *When all patient services departments are considered, the entire clinic is projected to use 10,000 hours of housekeeping services, so the total amount allocated must be  $\$10 \times 10,000 = \$100,000$ , which is the amount in the cost pool.*
- *For any department, the amount allocated depends on both the allocation rate and the amount of overhead services used.*

# Estimating Costs

## *Cost Allocation Methods*

- *Mathematically cost allocation can be accomplished in a variety of ways, and the method used is somewhat discretionary.*
- *No matter what method is chosen, all support department costs eventually must be allocated to the departments (primarily patient services departments) that create the need for those costs.*

# Estimating Costs

## *Cost Allocation Methods*

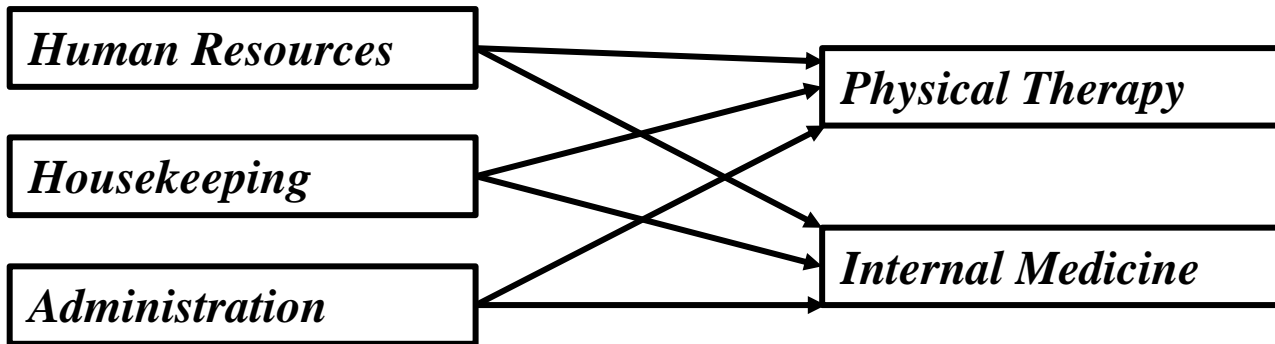
- *The key differences among the methods are how support services provided by one department are allocated to other support departments.*
- *Exhibit 4.4 summarizes the three primary allocation methods as applied to Prairie View Clinic.*
- *To simplify the illustration, the clinic has only three support departments (**Human Resources, Housekeeping, and Administration**) and two patient services departments (**PT and Internal Medicine**).*

*Exhibit 4.4 Prairie View Clinic: Alternative Cost Allocation Methods*

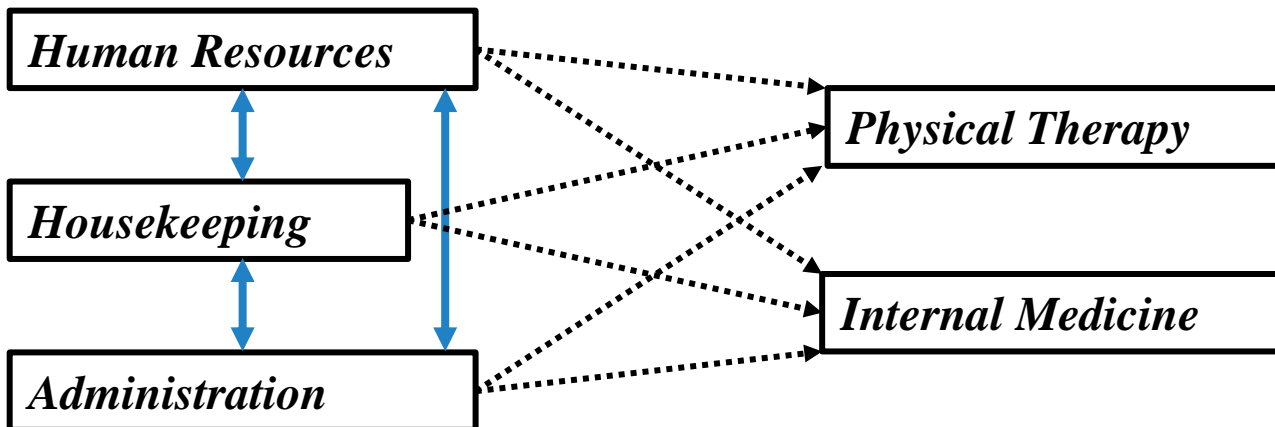
*Support Departments*

*Patient Services Departments*

*Direct Method*



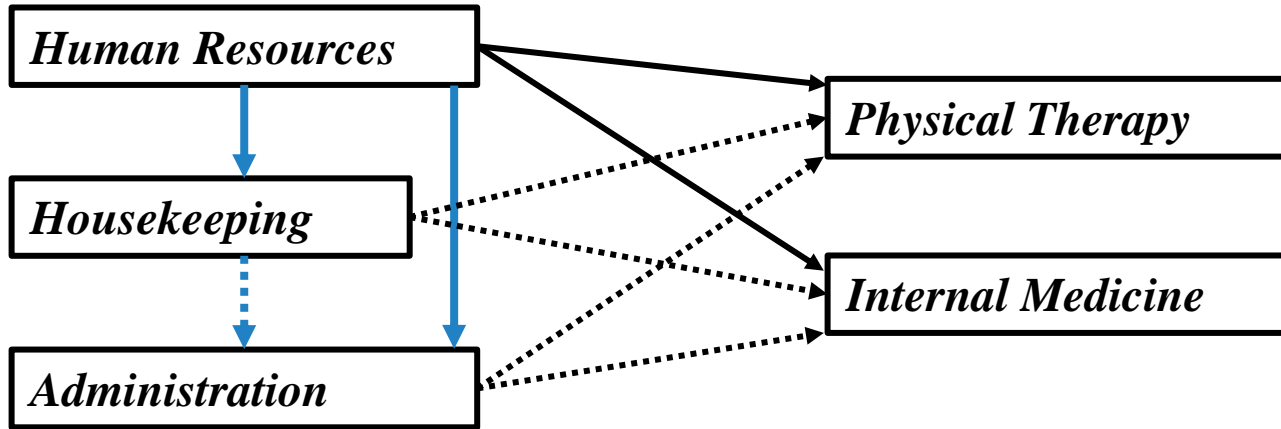
*Reciprocal Method*



*Exhibit 4.4 Prairie View Clinic: Alternative Cost Allocation Methods*

*Support Departments  
Step-Down Method*

*Patient Services Departments*





# Estimating Costs

## *Cost Allocation Methods*

- *Direct Method* A cost allocation method that allocates overhead costs directly to patient services departments.
- *This method does not recognize services provided by one support department to another.*
- *Under the direct method, shown in the top section of exhibit 4.4, each support department's costs are allocated directly to the patient services departments that use the services.*

# Estimating Costs

## *Cost Allocation Methods Direct Method*

- The key feature of the direct method, and the feature that makes it relatively simple to apply, is that none of the costs of providing support services are allocated to other support departments.*
- In effect, under the direct method, only the direct costs of the support departments are allocated to the patient services departments because no indirect costs have been created by intra–support department allocations.*

# Estimating Costs

## *Cost Allocation Methods Reciprocal Method*

- the reciprocal method recognizes the support department interdependencies among Human Resources, Housekeeping, and Administration, and hence the reciprocal method generally is considered more accurate and objective than the direct method.*

# Estimating Costs

## *Cost Allocation Methods Reciprocal Method*

- *The reciprocal method derives its name from the fact that it recognizes all services that departments provide to and receive from other departments.*
- *The good news is that this method captures all of the intra-support department relationships, so no information is ignored and no biases are introduced into the cost allocation process.*

# Estimating Costs

## *Cost Allocation Methods Reciprocal Method*

- *The bad news is that the reciprocal method relies on the simultaneous solution of a series of equations representing the use of intra-support department services.*
- *Thus, it is relatively complex, which makes explaining it to department heads difficult and implementing it costly.*

# Estimating Costs

## *Cost Allocation Methods Step-Down Method*

- *The step-down method, represents a compromise between the simplicity of the direct method and the complexity of the reciprocal method.*
- *It recognizes some of the intra-support department effects that the direct method ignores, but it does not recognize the full range of interdependencies.*

# Estimating Costs

## *Cost Allocation Methods Step-Down Method*

- *The step-down method derives its name from the sequential, staircase pattern of the allocation process, which requires that the allocation take place in a specific sequence. Here is how it works.*
- ***First**, all the direct costs of Human Resources are allocated to both the patient services departments and the other two support departments.*
- *Human Resources is then closed out because all its costs have been allocated.*

# Estimating Costs

## *Cost Allocation Methods Step-Down Method*

- ***Next***, ***Housekeeping costs***, which now consist of both the direct costs of Housekeeping and indirect costs (the allocation from Human Resources), are allocated to the patient services departments and the remaining support department—Administration.
- ***Finally***, the direct costs of Administration and the indirect costs (the allocations from Human Resources and Housekeeping) are allocated to the patient services departments.



# Estimating Costs

## *Cost Allocation Methods Step-Down Method*

- The final allocation includes Human Resources, Housekeeping, and Administration costs because a portion of these support costs has been “stepped down” to Administration.*
- The critical difference between the step-down and reciprocal methods is that after each allocation is made in the step-down method, a support department is removed from the process.*

# Estimating Costs

## *Cost Allocation Methods Step-Down Method*

- *Even though Housekeeping and Administration provide support services back to Human Resources, these indirect costs are not recognized because Human Resources is removed from the allocation process after the initial allocation.*
- *Such costs are recognized in the reciprocal method.*

# Estimating Costs

## *Service Line Costing*

- *While cost measurement at the department level can help managers make decisions about pricing and service offerings, the holy grail of cost estimation is costing at the individual service or patient level.*
- *Understanding costs at the microlevel allows managers to focus on cost containment and to make better decisions when negotiating contracts with payers.*

# Estimating Costs

## *Service Line Costing*

- *Several methods are used to estimate costs at the service or patient level.*
- *Two traditional costing methods:*
  1. *cost-to-charge ratio (CCR) and*
  2. *relative value unit (RVU).*
  3. *Next, we discuss a bottom-up method called activity-based costing (ABC).*

# Estimating Costs

## *Service Line Costing*

- *The setting to illustrate costing at the service level, consider AL Nakheel Family Practice (NFP), a large physician group that provides multiple services to its patient population in Riyadh.*
- *NFP is organized into five departments, one of which is the Routine Services Department. For ease of discussion, we assume that the department provides only two services: X and Y.*
- *Data relevant to our illustrations are summarized in exhibit 4.5.*

*Exhibit 4.5 AL Nakheel Family Practice: Selected Routine Services Department Data*

	<i>Service X</i>	<i>Service Y</i>	<i>Total</i>
<i>Annual volume (visits)</i>	<i>5,000</i>	<i>5,000</i>	<i>10,000</i>
<i>RVUs per service</i>	<i>10</i>	<i>18</i>	
<i>Annual costs:</i>			
<i>Direct</i>	<i>\$ 242,500</i>	<i>\$ 485,000</i>	<i>\$ 727,500</i>
<i>Indirect (overhead)</i>			<i>300,000</i>
<i>Total costs</i>			<i>\$1,027,500</i>
<i>Annual charges</i>	<i>\$ 700,000</i>	<i>\$1,400,000</i>	<i>\$2,100,000</i>
<i>Annual revenues (reimbursements)</i>	<i>\$ 400,000</i>	<i>\$ 900,000</i>	<i>\$1,300,000</i>

# Estimating Costs

## *Service Line Costing*

- The department has 10,000 visits annually, split evenly between the two services (Service X and Service Y).*
- The department's total annual costs come to \$1,027,500.*
- These costs include the following: \$300,000 of department overhead (including both NFP overhead allocated to the department through a step-down cost allocation and department overhead that supports both services); \$242,500 for direct costs of service X; and \$485,000 for direct costs of service Y.*

# Estimating Costs

## *Service Line Costing*

- *The department's charges (based on chargemaster prices) total \$2,100,000, while actual revenues (reimbursements) total \$1,300,000, divided between the two services as shown in exhibit 4.5.*
- *Before we begin discussing the individual costing methods, we want to emphasize that this example is highly simplified.*
- *Its purpose is merely to give you a flavor of the alternative methods available for costing individual services.*



# Estimating Costs

## *Service Line Costing Cost-to-Charge (CCR) Method*

- *The cost-to-charge (CCR) method is the most basic of the three methods for costing individual services.*
- *The CCR method is based on two assumptions:*
  1. *The indirect costs allocated to the services constitute a single cost that is proportional across all services provided. In other words, each service consumes indirect costs in the same proportion as the department as a whole.*
  2. *Charges, or alternatively reimbursement rates, reflect the level of intensity of the service provided and hence the use of shared resources by each service, including both TFP and department overhead.*

# Estimating Costs

## *Service Line Costing Relative Value Unit (RVU) Method*

- In contrast to the CCR method, which ties overhead resource consumption to charges (or revenues), the relative value unit (RVU) method ties the use of overhead resources to the complexity and time required for each service.*
- In other words, this method uses the intensity of the service provided, as measured by RVUs, as the basis for allocating overhead.*

# Estimating Costs

## *Service Line Costing Activity Based Costing*

- *Our discussion thus far has focused on traditional costing methods.*
- *In essence, the traditional methods begin with aggregate costs, typically at the department level.*
- *Overhead costs are then allocated downstream, first to the patient services departments and then, using the CCR or RVU method, down to individual services.*
- *Thus, traditional methods can be thought of as top-down allocation.*

# Estimating Costs

## *Service Line Costing Activity-based costing (ABC)*

- *ABC uses an upstream approach to cost allocation. Its premise is that all costs in an organization stem from activities, hence its name.*
- *In ABC, because activities are considered the basic building blocks of costs, costs can be more easily assigned to individual patients, individual physicians, particular diagnoses, reimbursement contracts, managed care populations, and so on than in traditional costing.*

## *Exhibit 4.6 ABC Illustration: Initial Data and Allocation Rate Calculation*

<i>Activity</i>	<i>Annual Costs</i>	<i>Cost Driver</i>	<i>Service X</i>	<i>Service Y</i>	<i>Total Units of the Cost Driver</i>	<i>Allocation Rate</i>
<i>Check-in</i>	<i>\$ 50,000</i>	<i>Number of visits</i>	<i>5,000</i>	<i>5,000</i>	<i>10,000</i>	<i>\$ 5.00</i>
<i>Assessment</i>	<i>75,000</i>	<i>Number of minutes per visit</i>	<i>5</i>	<i>10</i>	<i>75,000</i>	<i>1.00</i>
<i>Diagnosis</i>	<i>250,000</i>	<i>Number of minutes per visit</i>	<i>10</i>	<i>15</i>	<i>125,000</i>	<i>2.00</i>
<i>Treatment</i>	<i>450,000</i>	<i>Number of minutes per visit</i>	<i>10</i>	<i>20</i>	<i>150,000</i>	<i>3.00</i>
<i>Prescription</i>	<i>2,500</i>	<i>Number of drugs prescribed per visit</i>	<i>0.5</i>	<i>2.0</i>	<i>12,500</i>	<i>0.20</i>
<i>Checkout</i>	<i>50,000</i>	<i>Number of visits</i>	<i>5,000</i>	<i>5,000</i>	<i>10,000</i>	<i>5.00</i>
<i>Billing</i>	<i>150,000</i>	<i>Number of bills per visit</i>	<i>1.0</i>	<i>2.0</i>	<i>15,000</i>	<i>10.00</i>
<i>Total costs</i>	<i>\$1,027,500</i>					

# Estimating Costs

## *Service Line Costing Activity-based costing (ABC)*

- *ABC allows managers to estimate the costs of individual services and hence provides managers with information that can be used in pricing and contract negotiations.*
- *However, the data and resource requirements to establish an ABC system far exceed those required for traditional costing.*

*Exhibit 4.7 ABC Illustration: Final Aggregation of Activity Costs per Visit*

<i>Activity</i>	<i>Cost Driver</i>	<i>Allocation Rate</i>	<i>Service X Consumption of Cost Driver</i>	<i>Cost</i>	<i>Service Y Consumption of Cost Driver</i>	<i>Cost</i>
<i>Check-in</i>	<i>Number of visits</i>	<i>\$ 5.00</i>	<i>1</i>	<i>\$ 5.00</i>	<i>1</i>	<i>\$ 5.00</i>
<i>Assessment</i>	<i>Number of minutes</i>	<i>1.00</i>	<i>5</i>	<i>5.00</i>	<i>10</i>	<i>10.00</i>
<i>Diagnosis</i>	<i>Number of minutes</i>	<i>2.00</i>	<i>10</i>	<i>20.00</i>	<i>15</i>	<i>30.00</i>
<i>Treatment</i>	<i>Number of minutes</i>	<i>3.00</i>	<i>10</i>	<i>30.00</i>	<i>20</i>	<i>60.00</i>
<i>Prescription</i>	<i>Number of drugs</i>	<i>0.20</i>	<i>0.5</i>	<i>0.10</i>	<i>2.0</i>	<i>0.40</i>
<i>Checkout</i>	<i>Number of visits</i>	<i>5.00</i>	<i>1</i>	<i>5.00</i>	<i>1</i>	<i>5.00</i>
<i>Billing</i>	<i>Number of bills</i>	<i>10.00</i>	<i>1.0</i>	<i>10.00</i>	<i>2.0</i>	<i>20.00</i>
<i>Total costs</i>				<i>\$75.10</i>		<i>\$130.40</i>

# Estimating Costs

## *Service Line Costing Activity-based costing (ABC)*

- *For this reason, traditional costing still dominates the healthcare arena, but ABC is becoming more prevalent as the need for better cost data increasingly becomes important and providers invest in newer and more powerful managerial accounting systems.*



# Estimating Costs

*This chapter points out that managers rely on managerial accounting information to plan for and control a business's operations. A critical part of this information is the measurement and allocation of costs. Here are the key concepts:*

- *Costs can be classified by their relationship to the amount of services provided. Total variable costs are expected to increase and decrease with volume (patient days, number of visits, and so on), while total fixed costs are expected to remain constant regardless of volume (within some relevant range).*

# Estimating Costs

*Here are the key concepts:*

- *The relationship between cost and activity (volume) is called cost behavior.*
- *An organization's mix of fixed and variable costs is called underlying cost structure, or just cost structure.*
- *Costs can also be classified according to their relationship to the unit being analyzed. **Direct costs** are the unique (exclusive) resources used only by one unit of an organization, such as a department, and therefore are fairly easy to measure. **Indirect (overhead) costs**, in contrast, are inherently difficult to measure at the unit level because they constitute a shared resource of the overall organization, such as administrative costs.*

# Estimating Costs

*Here are the key concepts:*

- *Cost allocation is a critical part of the costing process because it addresses the issue of how to assign the costs of support activities to the revenue-producing (patient services) departments. The goal of cost allocation is to assign all costs of an organization to the activities that cause them to be incurred.*
- *A cost pool is the dollar amount of one type of overhead services to be allocated. In general, a cost pool consists of the total costs of one support department. However, under some circumstances, it may be better to divide the costs of a single support department into multiple cost pools.*

# Estimating Costs

*Here are the key concepts:*

- *A cost driver is the basis for making allocations from a cost pool. Cost drivers are chosen on the basis of their positive correlation with the amount of overhead services used by the patient services departments.*
- *An effective cost driver is fair and will promote cost reduction in the organization.*
- *The three primary methods for cost allocation are direct, reciprocal, and step-down. Regardless of the allocation method, all costs eventually end up being allocated to the patient services departments.*

# Estimating Costs

*Here are the key concepts:*

- *The direct method recognizes no intra–support department services. Thus, support department costs are allocated exclusively to patient services departments.*
- *The reciprocal method recognizes all intra–support department services. However, the reciprocal method is the most difficult to understand and to implement.*
- *The step-down method represents a compromise between the direct and reciprocal methods that recognizes some intra–support department services.*

# Estimating Costs

*Here are the key concepts:*

- *The primary methods for costing individual services are (1) cost-to-charge ratio (CCR), (2) relative value unit (RVU), and (3) activity-based costing (ABC).*
- *Activity-based costing allocates costs on the basis of the activities that create costs in the first place. Thus, ABC can estimate costs for individual services more precisely than traditional costing methods do and can even estimate costs for individual patients, diagnoses, physicians, reimbursement contracts, and so on. However, ABC requires a more sophisticated and costly managerial accounting information system than does traditional costing through CCR or RVU methods.*



*THANK YOU*